

United States Fire Administration

Urban Search and Rescue in San Bernardino, California, Following a Major Train Derailment in a Residential Neighborhood



**Federal Emergency Management Agency
United States Fire Administration
Office of Firefighter Health and Safety**

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Urban Search and Rescue Program

As a result of a number of major emergencies including structural collapse both here and abroad over the last decade, the concept of urban search and rescue (USAR) has become increasingly recognized as an important element in integrated emergency response. These incidents include catastrophic earthquakes in California, the Philippines and Soviet Armenia and structural collapses in Brownsville, Texas and New York City. Following Hurricane Hugo and the California earthquake in 1989, both of which served to draw attention to the need for improved urban search and rescue capabilities and resources, the Federal Emergency Management Agency (FEMA) undertook a major initiative to establish a National Urban Search and Rescue System.

The initial goal of the FEMA program has been to establish 25 qualified USAR task forces placed strategically throughout the nation. These task forces provide the ability to respond to major incidents a few hours of activation and offer a full range of capabilities in incident management; search; rescue; specialty medical care for entrapped patients; and technical disciplines including structural engineering heavy equipment operation, hazardous materials and communications.

In addition, an Advisory Committee on the National USAR System has been formed consisting of federal experts, state and local officials, and the private sector to guide further development of the System and to serve as a forum for discussing issues and exchanging information related to urban search and rescue.

To complement the efforts of the Federal Emergency Management Agency in Urban Search and Rescue, the United States Fire Administration (USFA) has also initiated research and development and information dissemination efforts on USAR. Study reports are being produced for USFA under its 'Investigation of Urban Search and Rescue Incidents' program that will broaden the base of information available about USAR tactics, management and technology, and contribute to reducing the number and severity of casualties by highlighting the lessons learned, both the successes and the failures, from such operations in the past. The investigation reports, such as this one, provide detailed information about the magnitude and nature of the incidents themselves; how the response to the incidents was carried out and managed; and the impact of these incidents on emergency responders and the emergency response systems in the community. The United States Fire Administration greatly appreciates the cooperation and information it is receiving from the fire service, county and state officials, and other emergency responders as this research progresses.

Additional copies of this report can be ordered from the Federal Emergency Management Agency/United States Fire Administration. For more information about USFA's program, write United States Fire Administration, 16825 South Seton Avenue, Emmitsburg, Maryland 21727.

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This Report of the Urban Search and Rescue Investigations Program was produced under contract EMW-91 -C-3679 for the United States Fire Administration, Federal Emergency Management Agency.



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**Urban Search and Rescue
in San Bernardino, California, Following a Major
Train Derailment in a Residential Neighborhood
May 12, 1989**

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OVERVIEW

The City of San Bernardino was struck by two disasters in the same neighborhood during the month of May 1989. These happened just 13 days apart. The first occurred on May 12 at 7:41 a.m. when a runaway Southern Pacific train traveling at over 100 miles per hour careened off a track causing six locomotives and 69 hopper cars to land on a row of residential houses at the bottom of a 25-foot embankment. Over 6,900 tons of powdered potash being carried in the cars spilled out onto the homes worsening an already disastrous situation.

On May 25 at 8:05 a.m., the second disaster occurred at the exact location of the previous one. A 14-inch high-pressure gasoline pipeline buried underground alongside the train tracks ruptured sending the hazardous liquid 200 to 300 feet in the air. A source of ignition was found and an explosion followed with a ball of flame enveloping a section of the already severely damaged neighborhood.

Both times, Duffy Street was the hardest hit (see Appendix A for Area Map) thus the two incidents became known as the “Duffy Street Disasters.” As this case study is directed toward Urban Search and Rescue, the train derailment will be addressed. It produced the following grim statistics:

- Two young half-brothers died in their home under tons of wreckage.
- Two train crewmen were killed when the train plummeted down the embankment.
- 15 people were injured.
- Six houses destroyed.
- Four houses with minor damage.
- Five locomotives destroyed.
- One locomotive damaged.
- 69 hopper cars destroyed.
- 12,000 gallons of diesel fuel spilled.
- More than \$1,220,000 in property damage in the community not including the locomotives and cars.

With all of the anguish and destruction, there was one happy event during this tragedy. This was the successful rescue of a man who had been pinned for 15 hours in the wreckage of his mother’s Duffy Street home, buried under a huge pile of twisted hopper cars and potash. Rescuers from the San Bernardino Fire Department working under the direction of a Division Chief from the Loma

Linda Department of Public Safety painstakingly cleared the heavy debris and potash that lay on top of the victim after he was located by search dogs. Once this superb feat was accomplished, medical authorities determined the man did not suffer any life-threatening injuries. This was declared remarkable considering the extremely dangerous situation from which he was rescued.

ACKNOWLEDGEMENTS

The Federal Emergency Management Agency, United States Fire Administration gratefully acknowledges the contributions of Battalion Chief Ron Izard, San Bernardino Fire Department, who had served as Incident Commander at the outset of this emergency, then moved to Operations Chief when relieved, and Division Chief Gene Brooks, Loma Linda Department of Public Safety, who was brought in on mutual aid and took over as rescue team supervisor. Additional thanks go to Richard McGreevy, San Bernardino Disaster Preparedness Coordinator.

THE DERAILMENT

The freight train apparently lost its brakes shortly before the derailment while traveling downgrade from Mojave, California, en route to Long Beach and just prior to coming into San Bernardino. About 20 miles before reaching the derailment site, an engineer in one of the rear locomotives radioed a "May Day" call stating the train was a runaway. A short time later the train failed to negotiate a curve on a grade above a San Bernardino neighborhood and six engines and 69 hopper cars carrying 6,900 tons of potash plunged down a 25-foot embankment piling into a row of homes. The tremendous impact caused huge clouds of dust to be pushed upward over the wreck.

Not only were homes buried, but fire hazards were posed with the spillage of diesel fuel from the locomotives and a broken natural gas pipeline. The leaking gas line prompted fire and police officials to evacuate the area when search and rescue operations began. Another potential fire hazard was the underground 14-inch, high-pressure gasoline pipeline along side of the tram tracks. Flow of gasoline through the line was stopped mitigating the danger for that day, at least. (However, 13 days later when flow had been restarted a large explosion and fire occurred.)

EMERGENCY RESPONSE

On May 12 at approximately 7:41 a.m., 911 dispatchers for the City of San Bernardino received a report of a train and automobile collision. As this appeared to be a routine call, the fire department dispatcher sent Engine 223 for a single company response.

The responding engine was one of eleven engine companies, two truck companies, one heavy rescue, and one Air Utility Unit that are the first line apparatus for the San Bernardino City Fire Department providing a total of 51 officers and firefighters. Staffing consists of three firefighters per unit for a total budgeted complement of 192 personnel. The command structure provides a Chief of Department with one Deputy Chief and eight Battalion Chiefs, with the City's Disaster Preparedness Coordinator assigned to the Fire Department. A population of 135,000 people spread over 54 square miles that includes residential areas, commercial districts, a major Air Force base, and wildlands near the San Bernardino National Forest are protected by the Department.

When Engine 223 left quarters, crew members were surprised to see a tremendous cloud of dust over the area they were responding to. At the same time, the 911 dispatchers were deluged with calls reporting a train had derailed

into homes on Duffy Street. These calls resulted in the response being upgraded to two engines, a truck, and a Battalion Chief. The first assigned Battalion Chief was Ron Izard, who responded from headquarters. Chief Izard quickly sized up the situation by driving around the perimeter and then established a command post on Duffy Street. The Incident Command System was established. In addition, Chief Izard determined the open hopper cars were not carrying hazardous materials.¹

As Incident Commander, Chief Izard requested additional resources assigning paramedics to the Triage Center and other firefighters to search and rescue operations. He divided the incident into three divisions for search and rescue. Chief Izard also assigned units to contain spilled fuel and shut down broken natural gas lines. This included evacuation of many buildings as well. Evacuation of the west side of the 2300 block where the cars landed began at 7:43 a.m. when the first engine company arrived and was completed in 40 minutes. The other side of the street was evacuated in 1 hour and 23 minutes.

The mobile Command Post responded to the scene and backhoes, barricades, shoring, a tractor, and the Foam Unit were requested. While these actions were taking place, Southern Pacific's wrecking crew arrived with two 100-ton cranes.

At 8:02 a.m., the City of San Bernardino's Emergency Operations Center was activated by Disaster Preparedness Coordinator Richard McGreevy, implementing the Emergency Operations Plan. This provided full functional support for field operations. The Emergency Operations Center is located in the

¹ Potash is the generic name for the chemical compounds potassium hydroxide (KOH) and potassium carbonate (KCO₂). In transportation, "potash" is commonly used to describe KOH, which is a nonflammable, mildly corrosive material which is soluble in water. It should be noted that if certain metals are present dry potash may react with water to form hydrogen gas which may be easily ignited.

basement of City Hall. Chief Dick Moon, since retired, responded there in the early stages of the incident, later moving to the Field Command Post until after rescue operations were completed.

Public Information Officers (PIO) from the Mayor's Office, the Police Department, and the Fire Department were at the disaster site to assist the media. In addition, a Public Information Officer was assigned by the Mayor to the staff of the Emergency Operations Center. They were kept extremely busy holding news conferences, conducting tours of the scene, and issuing press releases.

SEARCH AND RESCUE

When the Fire Department units arrived, they were surrounded by residents of the demolished homes pleading with the firefighters to find their families and friends. Incident Commander Izard immediately directed the Triage Center to be set up along with assigning incoming resources to search and rescue operations. He divided the scene of the disaster into three sectors: north, south, and east with a staging area to the west. Directions were given to search inward from the least to the most severely damaged homes. Also, counselors from the County Mental Health Department, the San Bernardino Unified School District, and contractors known as the "Counseling Team" were activated to help with many distraught residents. The counselors proved to be invaluable in ascertaining from the neighbors the possible locations of people not accounted for. Incident Commander Izard was relieved at 8:10 a.m. by the then Deputy Chief, Jim Knight. Chief Izard was assigned to take over operations. The incident command system was utilized to control all activities on scene.

Two deceased half-brothers were soon found in the remains of their Duffy Street home that had been crushed by the huge train. One brother was nine, and the other was seven years of age. This was a very sad moment for the search and rescue teams. Around the same time, firefighters using a cutting torch cut through the structural members of the lead locomotive's cab to extricate the body of the train's conductor. The three victims were carried to an empty garage that had been converted to a temporary morgue for examination by a forensic pathologist before being transported to the Coroner's facility.

Two potential victims were still unaccounted for. Credible reports indicated a 24-year-old male had been in his mother's home at the time of the accident and had not been seen since. The other was the train's brakeman who had been riding in the third lead locomotive. The brakeman was completely buried under debris and potash, in an upside-down position. His body was not located until the next morning.

The Incident Commander was advised to bring heavy equipment to remove the tons of debris where the missing 24-year-old was thought to be, but because of the dangerous, unstable conditions, he felt caution was required. Due to the magnitude and complexity of the search and rescue problem and with an outside chance that the victim, Chris Shaw, might still be alive under his mother's flattened house and tons of debris, the Incident Command decided upon the need for Search Dogs. The State Office of Emergency Services was contacted, who in turn notified the California Rescue Dog Association of this need. Two dogs along with their handlers were flown south from the San Francisco Bay area.

Next, the Southern Pacific crews staged two 100-ton derrick cranes in front of the pile of wreckage, which consisted of freight cars and a locomotive plus tons of potash resting on what was once Chris Shaw's mother's house. This was at approximately 2:00 p.m. Southern Pacific Railroad provided personnel and

logistical support that included everyone from riggers to car-shop foremen to vice presidents

A local house-moving contractor was brought in to add expertise as well as supplying heavy timber shoring and hydraulic lifting jacks. Night lighting was furnished by contracting for a three-million-candlepower light tower.

At 2:15 p.m., the Incident Commander requested mutual aid from the City of Loma Linda Department of Public Safety. His request included Division Chief Gene Brooks, a senior heavy rescue instructor specializing in debris and tunnel shoring.

Upon arrival, Division Chief Brooks was assigned to relieve the rescue team supervisor. He immediately requested three 8-person digging and debris removal teams, to rotate in 20-minute shifts. The teams were a mix of fire personnel and crews from the Public Works Department.

Due to the stacked configuration of the debris and wreckage, it was decided to dig vertical shafts with horizontal laterals as the safest approach. With his decision, Division Chief Brooks compared the construction of other homes in the neighborhood to the Shaw's home. Most homes in the area were of wood-frame construction and one story in height. After sketching a sample floor plan, he gave it to a psychologist who was contracted by the City, to review it with the distraught Shaw family. The family revised the floor plan and it was returned to the Division Chief. With a Southern Pacific car-shop foreman, Division Chief Brooks began a survey of the stacked debris pile in the area of the house seeking out potential problems and the best means of moving the wreckage on top of the Structure.

At this time, two handlers arrived with their search dogs. One dog was a female doberman and the other was a male German shepherd.

Next, Gary Heston, an Assistant Heavy Rescue Instructor from the Lake Arrowhead Fire Department, who is also a ham radio operator, installed an amateur television link from the rescue site to the Command Post. This enabled the Incident Commander and Operations Chief to have a visual and audio view of the rescue scene. This was done at 7:30 p.m.

When all personnel in the area of the Shaw home were relocated downwind, the dogs commenced their survey of the area. Their attention was drawn to the top of the debris pile in the vicinity of the house. Scratching and digging by both dogs centered on an area 10-feet in diameter.

The decision was made to begin rescue operations at the location that drew the dogs' attention in light of the floor plan of the house and an estimation of the impact direction, plus the fact that the location was in the center of an accessible entry area.

In order to begin rescue work, all loose potash and building debris were removed from a 6-foot wide by 30-foot long strip across the front of the house. This was done by hand. The discarded material was hauled away by a skip loader. Numerous small spaces were uncovered by this process allowing the dogs deeper access. Chain saws were used to cut off structural members that projected into the spaces. With a cleared strip in front of the rescue area, the derrick cranes were placed to support a hoppercar that had landed on the house and to keep it from settling and shifting.

At 9:00 p.m., rescuers found the victim alive when a San Bernardino City firefighter/paramedic observed the victim's fingers moving in a void. The victim

was conscious and when questioned identified himself as Chris Shaw. With further careful dig by hand, the victim's face was found close to the void. For the rest of the operation, a paramedic was assigned to keep rescuers informed of Shaw's condition.

It was determined the victim was in a semi-fetal position, completely buried below the level of his face and left hand. With this knowledge, rescuers were ordered off the debris pile directly above. Long handled shovels were then used to prevent cave-in as the potash was removed. At approximately 9:45 p.m., Shaw's upper torso was uncovered with the removal of the fourth strip of debris. His vital signs were monitored and he was placed in a cervical collar.

The method of excavation was to proceed from three directions: down from above, laterally from the face of the pile and laterally from its right side. The victim's exact location was determined when his feet were uncovered on the right side of the pile of debris. This placed Shaw against or under a 3,000 pound railroad car wheel frame. Although this was a major obstacle excavation continued. However, lateral excavation eventually provided enough maneuverability to remove Shaw without lifting the wheel frame.

From the time Shaw was found his air space was protected by a plastic bucket used as a tube placed over his head. This also gave him protection from light debris falling on his head. The major protection afforded the victim throughout the operation was a 3/4-inch section of plywood over him in the shape of a roof supported by two-by-four cribbing blocks. Additional protection was a 12-by-12-by-12 inch horseshoe shaped arch supporting the dome over Shaw's face.

It was 10:30 p.m. when the victim was lifted from the hole, placed on a backboard, and fitted with a MAST unit. With the establishment of an exit corridor, Shaw was moved from the wreckage and debris to an ambulance for

hospital transport. This was at 10:36 p.m., approximately 15 hours after the house, hopper cars, potash, and other debris were pushed down on him when the train jumped the track. The hospital assessed Shaw as being in serious, but stable condition with multiple lower-limb fractures and a slight compression fracture to the lower back

At 3:00 am. the next morning, the missing brakeman's body was extricated from the wrecked tram after being located by the search dogs. This brought the death total to four. Even with the unfortunate number of fatalities, there was the highly successful rescue of Chris Shaw after being entrapped in a tomb-like situation for about 15 hours. This could not have been accomplished without the dedication, skill, and determination of all those involved in the rescue operation.

FIRE OPERATIONS

Luckily, no fires occurred at the time of the train derailment. Fire operations for this incident consisted primarily of fire prevention actions. These included coordinating the shutdown of natural gas and electrical power lines in the neighborhood plus controlling rescue and clean-up operations near the 14-inch, high-pressure gasoline pipeline. The pipeline was buried at the base of the embankment on the east side of the train track.

This pipeline posed a serious threat to all response and recovery actions since one of the train's engines had fallen directly over the pipeline and was partially buried very close to it. As a precaution against a possible rupture of the line, sandbag dikes were built and the normal 1,600 pounds per square inch (psi) pressure on the line was reduced as much as possible. However, a check valve just north of the incident site failed to close properly so gravity pressure remained at approximately 800 psi. Attempts to drain the line proved futile as

approximately 400,000 gallons of fuel remained in it, and there was not sufficient storage capacity at the pipeline's Colton terminal to contain the fuel.

Due to the potential fire threat posed by the pipeline, the following equipment was on scene from one through four days as needed until all the wreckage was cleared away:

- 8 Engines
- 2 Trucks
- 2 Paramedic Squads
- 1 Rescue Van
- 1 3/4 Ton Truck
- 1 Norton Air Force Base Foam Truck
- 1 Rialto City Foam Unit
- 1 Water Tanker

In addition, the Fire Department's Incident Commander was responsible for hazardous materials operations. These operations during the response phase were handled by the County's Interagency Hazardous Materials Team, which contained a spill of approximately 12,000 gallons of diesel fuel from the locomotives. The diesel fuel remaining in tanks was pumped into a tank truck to prevent further leakage.

Personnel and equipment from the following agencies assisted during various stages of the rescue and recovery operations:

- California Department of Forestry
- Central Valley Fire Protection District
- Colton City Fire Department
- Foothill Fire District
- Loma Linda City Fire Department

- Norton Air Force Base Public Safety Department
- Redlands City Fire Department
- Rialto City Fire Department
- U.S. Forest Service

Through a contract with a local counseling team, emergency services personnel were debriefed several days following the incident to deal with critical incident stress issues.

LESSONS LEARNED

From the Incident Commander's Perspective

1. *Rescue dogs, a new resource to many emergency personnel, were valuable assets.* If only they could talk! Rescue workers must learn to accept the subtle indicators the canines give.
2. *Victims can, have, and do survive the most incredible catastrophes.* Always give the victim the benefit of the doubt.
3. *Obtaining resources takes time.* Plan ahead and don't be embarrassed if resources are called but not used. A third crane was positioned to free Shaw, but was not needed. Developing and maintaining a list of resources in the community can save critical time in a major incident such as this.
4. *Amateur television links are a new technology that can be a valuable tool if used correctly.* This was done at the train derailment to assist the Command Post. Contact your local ham radio club for details.

5. ***The efficient running of an Emergency Operations center can make the Incident Commander job much easier.*** Purchase orders can be processed, resources identified, and suppliers assured of proper payment. All agencies that staff the EOC should participate in at least one exercise simulating a disaster every year.
6. ***The advantages of early setup of an Incident Command structure cannot be overemphasized.*** This was proven at the site of the train derailment.
7. ***The early implementation of a public Information Officer is essential.*** This major incident required two field PIOs supplying information to a centralized PIO at the Emergency Operations Center. It took pressure off the Command Post. Also, PIOs held periodic news conferences and guided disaster site tours for the media. The concept of “pool feed“ video was not used but should be considered.
8. ***Bring in counselors or therapists during the early stages of search and rescue.*** They can not only comfort relatives and friends of victims but also gain valuable information, i.e., possible locations of victims, construction configurations, and when and where possible victims were last seen.
9. ***Plan for food and drink if the operation is to be a lengthy one.*** Portable toilets should be included in this planning.
10. ***Make certain fore hazards are mitigated before beginning search and rescue.***
11. ***A system of Marking is necessary for multiple searches of buildings.*** Although police-type barrier tapes may be used for one-time searches, if it is necessary to do more than one search, a simple marking system should be used, and it must be standardized for use among different rescue teams.

12. ***Cellular phones are needed when normal communications systems are overburdened.*** Cellular phones played an important role in the Duffy Street Train Disaster, although there did not seem to be enough. Since then the San Bernardino Fire Department has purchased more.

13. ***Planning for major emergencies should include a review of the types of services, equipment, and personnel the phone company called upon to provide.*** The telephone company helped tremendously in this incident by providing a patch-in to phone lines for the Command Post. This should always be given consideration.

14. ***Planning with law enforcement agencies needs to ensure that emergency vehicles and mutual aid units can get through traffic and blockades.*** In this emergency, the Police Department's blockade delayed some mutual aid units in reaching the Staging Area.

15. ***Request Animal Control Officers at the start of the search and rescue.*** Frightened dogs may prevent searchers from entering the premises. The Police Department may also be useful under such circumstances.

16. ***The Incident Commander has the ultimate responsibility for the success of the rescue operation and the safety of the rescue workers.*** No major decision should be made without his knowledge and approval. At one point during the rescue operations, the Southern Pacific crew began moving in the two 100-ton cranes to position them at a very hazardous location endangering other personnel without checking with the Incident Commander. When he became aware of this he immediately stopped the action.

17. ***The Incident commander Should be prepared to use other resources besides*** firefighters. A manpower pool of firefighters very quickly becomes depleted and others such as Department of Works personnel usually have the skills and abilities to work alongside the firefighters in search and rescue operations. However, this must be accomplished under direct and careful guidance and supervision.
18. ***Care must be given when selecting people for specific rescue activities.*** At the Duffy Street derailment the Rescue Team Supervisor, thinking a house mover had the same expertise as a rigger, directed him to put a sling under a 500-700 lb. train coupler to lift it clear of the pile of debris. Unfortunately the house mover did not have the expertise, and a serious accident almost happened directly over the head of the buried victim.
19. ***The Incident Commander should be flexible and open to recommendations.***
20. ***The safety of rescue workers must always be given highest priority.***
21. ***Fire and emergency service officers need training in the management of search Dog teams.*** The first dogs used at the train derailment to locate victims were police dogs. They were not trained to pick-up human scent under search and rescue conditions. The Incident Commander must always make certain that appropriately trained dogs are used.

After the Search Dogs located the approximate area under which Chris Shaw was eventually found alive, they were moved away to continue their work. The Division Chief who managed the entire successful rescue operation believes the dogs should have shared in the exhilaration of the rescue. This not only would have given them some sense of accomplishment but also it would have proven useful to the dogs' training.

From the Perspective of the Emergency Operations Center Coordinator

22. *Enlist EOC based on knowledge of functional areas, interest in Eoc operations and earned authority.*

23. Keep EOC set up, ready to activate. All telephones, radios, status boards, and supplies should remain in place. Recall lists and checklists should also be up-to-date. The most critical actions occur within the first hour.

24. *Develop support with EOC liaisons.*

25. *Pre-negotiate contracts for emergency supplies/equipment.* There should be prearranged contracts for the availability of resources such as food, beverages, porta-potties, lighting, breathing apparatus, barricades, cranes, backhoes, bulldozers, and transport equipment in emergency situations.

26. *Train, train, train --* Exercise, exercise, exercise.

27. *Use appropriate outside liaisons.* Agencies such as the Red Cross, RACES, the School District, the County, and State should be used.

28. *Double-check reports, requests, and actions taken.* Don't assume anything.

29. *Round up as much communications equipment as possible.* Cellular phones, radios, FAX machines, and telephones should be collected.

30. *Use multiple public information Officers.* You can't have enough trained PIOs

31. ***Restrict flights over a disaster scene.*** This is particularly so for media helicopters Request the Federal Aviation Administration to do so.
32. ***Conduct periodic update briefings.***
33. ***Think ahead Be proactive versus reactive.*** Stage equipment, supplies, and personnel. Think recovery and mitigation during response.
34. ***Insist on use of functional logs and message forms.*** Document every action, contact, and time.
35. ***Periodically dew on-scene resources.*** Remove those not needed.
36. ***Track all expenses.*** Issue emergency account and work order numbers at the start of the operation. Regular and overtime personnel costs should be tracked.
37. ***Designate a select team to direct and monitor recovery actions.*** Ensure responsibilities are well-known. Hold periodic update meetings.
38. ***Be sensitive to victims concerns.*** Provide forums for relating concerns.
39. ***Hold critique ASAP after response phase.*** Invite all participants and ensure all views are heard.
40. ***Organize follow-up actions for critique items.*** Assign responsibility for each action such as updating plans and checklists and monitor completion.

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ADDITIONAL READINGS

Simmons, Allen. "California: Train Derailment and Pipeline Explosion
Devastate San Bernardino." On the Job Column, Firehouse, October 1989.

"Three People Killed, Several Injured After Runaway Train Jumped Track."
Emergency Preparedness News, May 15, 1989.

Wait, James. "Six Die in Twin Tragedies." Fire Command, July 1990.

Appendix A
Photographs



(Photos provided by Richard McGreevy, San Bernardino Disaster Division/Fire Department)

Aerial view of train derailment crash site, viewed from east to west. Duffy Street is in the foreground. Chris Shaw, buried victim, was in the debris of the house with two vehicles in the driveway in the left center of the photo.



(Photos provided by Richard McGreevy, San Bernardino Disaster Division/Fire Department)

Complete destruction of houses shown, taken from Duffy Street looking north.
Victim Chris Shaw was buried below the large hopper car jutting in the air.



*(Photos provided by Richard McGreevy, San Bernardino
Disaster Division/Fire Department)*

Aerial view of train derailment crash site, viewed from west to east.
The Shaw house is to the extreme right of the photo.



(Photos provided by Richard McGreevy, San Bernardino Disaster Division/Fire Department)

Hopper cars at bottom of embankment in backyards of destroyed houses.



(Photos provided by Richard McGreevy, San Bernardino Disaster Division/Fire Department)

Spilled potash, overturned hopper cars in foreground and at left.



(Photos provided by Richard McGreevy, San Bernardino Disaster Division/Fire Department)

Duffy Street house completely destroyed by overturned hopper cars, remaining roof seen at center of photo.



*(Photos provided by Richard McGreevy, San Bernardino
Disaster Division/Fire Department)*

Search and rescue operations underway.



(Photos provided by Richard McGreevy, San Bernardino Disaster Division/Fire Department)

Search and rescue crew remove casualty from crash site.